EXECUTIVE SUMMARY

In response to a request by the District of Columbia Office of Planning, the District of Columbia Department of Transportation (DDOT) has conducted a study evaluating the traffic impacts associated with different levels of development on the southern half of Square 37 in the Northwest section of the District of Columbia. The site is located north of L Street N.W. between 23rd Street and 24th Street N.W. The impetus for this transportation study was a zoning consistency review of the southern half of Square 37 undertaken by the District of Columbia Office of Planning (OP).

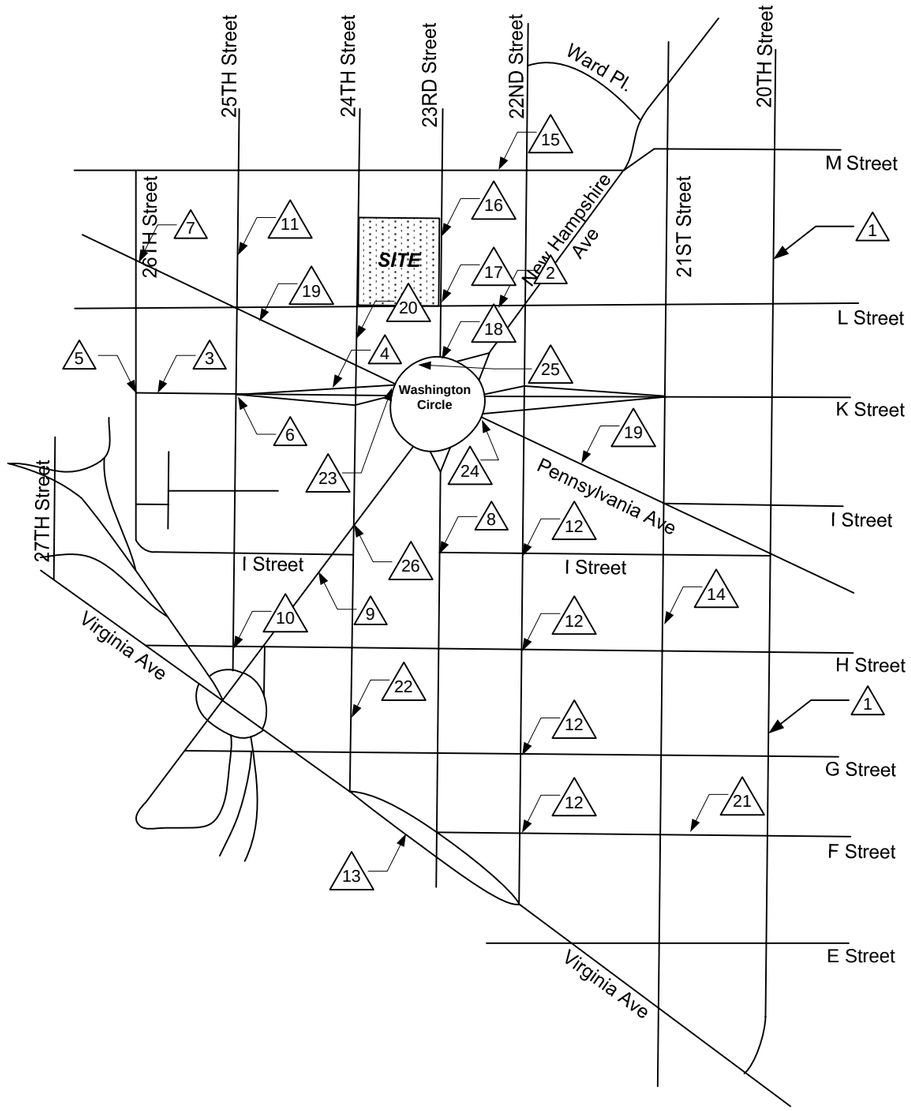
STUDY SCOPE

The main goal of the study was to assess the effects on transportation facilities associated with different levels of development at Square 37. The scope of the study was developed with input from representatives of the District Department of Transportation (DDOT), the District Office of Planning (OP), and the Office of the Deputy Mayor for Planning & Economic Development (DMPED). The Office of Planning utilized input from citizens and community groups to refine the study scope. Area residents provided input on key transportation issues in the area. The study included the following tasks:

- Evaluation of existing conditions.
- Assessment of transportation impacts of new development projects planned or approved in the area surrounding the site.
- Mitigation measures required to address existing and projected deficiencies.
- Evaluation of future conditions with proposed Square 37 rezoning.
- Development of recommendations.
- Documentation and public presentations.

Existing Conditions

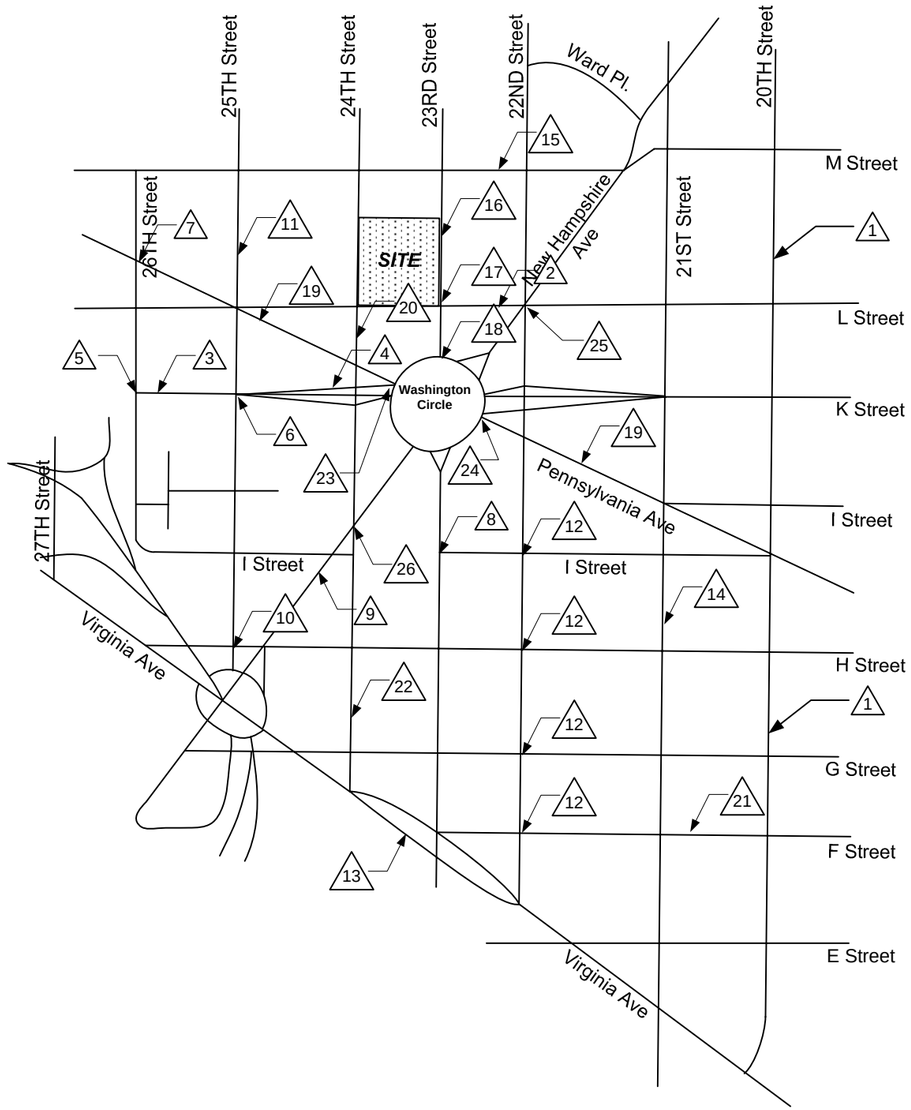
The Study Team used the data collected for the study, the field evaluations and input from residents to develop a comprehensive list of transportation issues in the study area. These issues are summarized in Figure A-1. The Study Team developed preliminary improvements to address the issues noted in Figure A-1, evaluated these improvements and developed a set of final recommendations. These recommended improvements are summarized in Figure A-2.



SQUARE 37 REZONING
SUMMARY OF ISSUES

1. Speeding on 20th Street
2. Fire Station signal between 22nd and 23rd Street
3. Speeding on K Street between 26th Street and Washington Circle
4. Illegal parking on the westbound ramp from Washington Circle to K Street
5. Pedestrian Safety at the intersection of K Street and 26th Street
6. Pedestrian Safety at the intersection of K Street and 25th Street
7. Pedestrian Safety at the intersection of Pennsylvania Avenue and 26th Street
8. Congestion and pedestrian safety at Foggy Bottom Metro Station (23rd and I)
9. Congestion and emergency vehicle access on New Hampshire Avenue between Washington Circle and Virginia Avenue
10. Pedestrian safety at New Hampshire Avenue and 25th/H Streets
11. Parking enforcement on 25th Street between L and M Streets
12. Pedestrian safety on 22nd Street at intersections with F, G, H and I Streets
13. Congestion on Virginia Avenue between 20th and 24th Streets
14. Congestion on 21st Street between Virginia Avenue and M Street
15. Congestion on M Street between 20th Street and 23rd Street
16. Congestion on 23rd Street between N Street and Washington Circle
17. Traffic operations on 23rd Street at L Street
18. Traffic operations on 23rd Street at Washington Circle
19. Parking violations along Pennsylvania Avenue
20. Parking violations on 24th Street between Pennsylvania Avenue and L Street
21. Parking enforcement on F Street between 20th and 22nd Streets
22. Parking enforcement on 24th Street between G and H Streets
23. Safety of traffic operations at Pennsylvania Avenue Northwest and the Washington Circle
24. Safety of traffic operations at Pennsylvania Avenue Southeast and the Washington Circle
25. Heavy Congestion at Washington Circle
26. Congestion at 24th Street and New Hampshire Avenue

Not to Scale		Square 37 Rezoning	Existing Conditions Issues Map	FIGURE A-1
September, 2002	N			



SUMMARY OF IMPROVEMENT OPTIONS TO ADDRESS EXISTING CONDITIONS

1. Install speed limit signs on 20th Street.
2. This signal should operate as a flashing yellow signal on L Street when not in use.
3. Increase enforcement of speeding in this section of K Street.
4. Increase parking enforcement. Provide a parking enforcement contact phone number for motorists.
5. Re-stripe the crosswalk. Three seconds should be added to the flashing DON'T WALK phase of this pedestrian signal to provide additional clearance time for crossing the street.
6. Re-stripe the crosswalk and install crosswalk sign on the median.
7. Re-stripe the crosswalk. Replace the damaged signal head at this location. Install pedestrian signal at this location. Provide four-second advance walk phase on 26th Street.
8. Implement the following: prohibiting vendor parking, prohibiting westbound right turns on red, re-striping the crosswalks and enforcing pedestrian crossing laws.
9. Stricter enforcement of existing parking regulations.
10. Enhance and re-place crosswalks. Extend centerline of 25th/H Streets at New Hampshire Avenue.
11. Replace missing sign.
12. Implement the following: re-stripe all crosswalks, enforce parking restrictions and enforce pedestrian crossing laws
13. Enforce peak period and tour bus parking regulations.
14. Enforce parking regulations.
15. Enforce parking regulations.
16. Signalize the intersection of 23rd Street and Washington Circle, Street to shared through/left, and increased enforcement of parking regulations. After signalization use a three lane approach at the circle. Construct fourth lane on 23rd Street between N and L Streets.
17. Prior to signalization of 23rd Street and Washington Circle, add a pavement marking arrow and “ONLY” legend at this location.
18. Prior to signalization of 23rd Street and Washington Circle, re-stripe lane control markings.
19. Enforce parking regulations.
20. Enforce parking regulations, including diplomat parking.
21. Install “No Double Parking” signs and enforce parking restrictions.
22. Install “No Double Parking” signs and enforce parking restrictions.
23. Signalize intersection of Pennsylvania Avenue Northwest and the Washington Circle.
24. Signalize intersection of Pennsylvania Avenue Southeast and the Washington Circle.
25. Change New Hampshire Avenue to two-way operation from Washington Circle to M Street.
26. Signalize Intersection of 24th Street and New Hampshire Avenue.

Not to Scale	N	Square 37 Rezoning	Recommended Improvements to Address Existing Transportation Issues	FIGURE A-2
September, 2002				

OTHER AREA DEVELOPMENT

In addition to the development of Square 37, several other projects in the vicinity are currently in either the planning or construction stages. The Office of Planning provided the information on other area developments. Other area developments included in the analysis for this study are the following:

- Columbia House Apartments – Phase I
- Columbia House Apartments – Phase II
- Park Hyatt Hotel Apartments
- IMF Headquarters 2
- Red Cross Headquarters
- George Washington University Replacement Hospital
- Two George Washington University Dormitories

Traffic impacts associated with these new developments were accounted for prior to including the impacts of selected development scenarios on Square 37.

SQUARE 37 DEVELOPMENT

Three development scenarios were selected for detailed transportation analysis, and a fourth option was analyzed with respect to associated trip generation. As shown in Table A-1, Option 1 will generate a negligible number of new trips. Option 2 is expected to generate more trips during the AM peak hour but less daily and PM peak hour trips than Options 3 and 4. Option 4 is expected to have the largest PM peak and daily trip generation.

SITE IMPACTS

The Study Team evaluated the impacts of the site development traffic on the intersections in the immediate vicinity of the site. The site impacts indicate what proportion of the forecast total traffic at a particular intersection is generated by new site traffic. All site impacts were calculated under two scenarios. One scenario assumes that New Hampshire Avenue continues to operate as a one-way street and the other assumes that New Hampshire Avenue between Washington Circle and M Street is converted to two-way operation.

The site impacts for Options 1 and 2 are estimated to be less than five percent at the intersections in the immediate vicinity of the rezoning site during the AM and PM peak hours. When the total volume at an intersection, after adding site traffic, is less than five percent greater than the original volume, the effect on intersection operations is considered to be a negligible. Contrastingly, the site impacts for Option 3 at several intersections in the vicinity of the site are expected to be more than five percent but less than 10 percent during the PM peak hour. This impact is considered marginal. Impacts of more than 15 percent are considered to be significant. The intersections most affected

by Option 3 traffic are New Hampshire Avenue and L Street, 23rd Street and L Street, 23rd Street and M Street, and 24th Street and M Street. This indicates that the implementation of Options 1 and 2 is expected to have a negligible effect on traffic conditions in the study area and Option 3 is expected to have a marginal negative effect on traffic operations and delays.

Table A-1
Net Trip Generation for the Different Land Use Scenarios

Option	Proposed Future Site Development	AM Peak Hour Trips			PM Peak Hour Trips			Daily Trips (2-Way)
		In	Out	Total	In	Out	Total	
1	Planned Unit Development in Zoning District R-5-B 166 Residential Units 19,060 Sq. Ft. Library	-24	24	0	7	-10	-3	130
2	Matter of Right in Zoning District C-R with Office 185 Residential Units 19,060 Sq. Ft. Library 165,575 Sq. Ft. Office	77	42	119	29	82	111	980
3	Planned Unit Development with Overlay in Zoning District R-5-E 369 Residential Units 19,060 Sq. Ft. Library 73,258 Sq. Ft. Retail	-7	77	70	129	72	201	1,960
4	Matter of Right in Zoning District C-R with Office and Retail 185 Residential Units 19,060 Sq. Ft. Library 77,575 Sq. Ft. Retail 88,000 Sq. Ft. Office	47	47	94	113	120	232	1,960

LEVELS OF SERVICE

The Study Team calculated levels of service (LOS) at all of the Study Area intersections with the traffic forecasted for each of the site development options. The Study Team conducted the analysis for future conditions for the year 2007. This assumes that the new development at the site would be completed by 2007. There are several intersections in the Study Area operating at LOS F during the AM and PM peak hours under existing conditions. Therefore, the Study Team made recommendations with respect to improvements needed to address existing deficiencies. Thus, the levels of service calculations for all future year scenarios were conducted assuming that improvements to address existing conditions would be in place.

As shown in Table A-2, compared to existing conditions, the implementation of Options 3 would result in slight degradation in LOS at approximately one-third of the study area intersections during the AM peak hour. The implementation of Option 2 would result in slight degradation in LOS at approximately two-thirds of the study area intersections during the AM peak hour. The implementation of Option 1 would result in slight

Table A - 2

AM Peak Hour Levels of Service for Site Development Options

		AM Peak Hour	AM Peak Hour with Improvements				
No	**Intersection**	**Existing Traffic No Improvements LOS**	**Existing LOS**	**2007 Other Area Traffic LOS**	**2007 Option 1 LOS**	**2007 Option 2 LOS**	**2007 Option 3 LOS**
1	25th Street and M Street	A	A	A	A	A	A
2	24th Street and M Street	A	B	A	A	B	B
3	23rd Street and M Street	A	A	A	A	C	A
4	M Street and New Hampshire Avenue	A	B	A	B	B	C
5	21st Street and New Hampshire Avenue	C	B	B	C	C	C
6	21st Street and M Street	B	B	B	B	C	D
7	20th Street and M Street	B	B	B	B	D	D
8	26th Street and L Street	B	B	B	B	B	B
9	25th Street / L Street / Pennsylvania Avenue	**F**	**F**	**F**	**F**	**F**	**F**
10	24th Street and L Street	B	D	B	B	E	B
11	23rd Street and L Street	B	A	B	B	E	B
12	L Street and New Hampshire Avenue	**F**	**F**	D	**F**	**F**	**F**
13	21st Street and L Street	B	B	B	E	B	B
14	20th Street and L Street	B	B	B	B	B	B
15	25th Street and K Street	E	**F**	**F**	**F**	**F**	**F**
16	24th Street and Pennsylvania Avenue	**F**	**F**	**F**	**F**	**F**	**F**
17	K Street Service Road and Washington Circle (NW)	C	**C**	C	C	C	C
18a	24th Street and K Street (N)	B	C	B	B	D	B
18b	24th Street and K Street (S)	E	**F**	**F**	**F**	**F**	**F**
19	K Street Service Road and Washington Circle (SW)	A	A	A	A	B	B
20	23rd Street and Washington Circle (N)	B	B	C	B	D	B
21	New Hampshire Avenue and Washington Circle (NE)	A	A	C	A	C	A
22	K Street Service Road and Washington Circle (NE)	A	A	A	A	A	A
23a	22nd Street and K Street (N)	C	C	B	C	D	B
23b	22nd Street and K Street (S)	B	B	B	B	B	B
24	21st Street and K Street	C	C	D	E	C	D
25	20th Street and K Street	B	B	B	B	B	B
26	Pennslyvania Avenue and Washington Circle (SE)	B	A	B	B	C	B
27	22nd Street and Pennsylvania Avenue	**F**	**F**	**F**	**F**	**F**	**F**
28	23rd Street and Washington Circle (S)	A	A	A	A	B	A
29	New Hampshire Avenue and Washington Circle (SW)	B	B	C	C	C	C
30	24th Street and New Hampshire Avenue	**F**	**F**	**F**	**F**	**F**	**F**
31	23rd Street and I Street	B	C	**F**	C	C	C
32	22nd Street and I Street	D	E	A	A	C	A
33	23rd Street and H Street	A	C	C	B	D	D

Note: The level of service for some of the intersections deteriorates under the scenario with improvements. This is due to the effect of additional traffic reaching internal intersections as a result of improved capacity at intersections that are currently metering the traffic at entry locations to the study area. While some of the intersections are expected to degrade due to the implementation of the proposed improvements, many intersections are expected to operate at much better LOS than today. Furthermore, the traffic model indicates that the overall delay for the study area network will be lower with the implementation of the proposed improvements during the AM and PM peak hours.

degradation in LOS at approximately one-quarter of the study area intersections during the AM peak hour. Generally, the degradation in traffic operations corresponds to one grade in the LOS scale; i.e., intersections that are currently operating at LOS A degrade to LOS B with the new site development. As shown in Table A-3, when compared to existing conditions, the PM peak hour LOS for Options 1, 2 and 3 is expected to degrade, generally by one letter grade, for approximately one-third of the Study Area intersections. It is important to note that at most of the intersections where the LOS degrades during the AM and PM peak hours, the resulting LOS is expected to be at acceptable levels.
In general, traffic conditions are worse during the PM peak hours. Under existing conditions, several intersections between the L and M Streets and 21st and 25th Streets N.W. are operating at LOS F. The traffic analysis indicates that they will continue to operate at LOS F under options 1, 2 and 3. The improvements recommended in the study to address existing conditions deficiencies are not sufficient to make all of the intersections in the study area to operate at acceptable levels of service. Major infrastructural improvements would have to be constructed in the area to improve the traffic conditions at the intersections operating at LOS F and make them operate at improved level of service.

FINDINGS AND RECOMMENDATIONS

Therefore, the Study Team concludes that there are insignificant differences on the effects on traffic operations between Options 1 and 2. The implementation of Option 3, however, would result in marginally worse traffic conditions than the conditions expected to occur under Options 1 and 2. Furthermore, the assessment of the three options indicates that no additional mitigation measures, other than the ones recommended to address existing conditions, need to be implemented to accommodate either Option 1, Option 2 or Option 3 level of development. Even though the Study Team did not conduct a full evaluation of Option 4, the trip generation estimates indicate that the effects on traffic operations associated with the implementation of this option is likely to be the same as the effects of Option 3.

Table A - 3

PM Peak Hour Levels of Service for Site Development Options

		PM Peak Hour	PM Peak Hour with Improvements				
No	**Intersection**	**Existing Traffic No Improvements LOS**	**Existing LOS**	**2007 Other Area Traffic LOS**	**2007 Option 1 LOS**	**2007 Option 2 LOS**	**2007 Option 3 LOS**
1	25th Street and M Street	A	A	**F**	B	E	A
2	24th Street and M Street	**F**	E	**F**	E	**F**	C
3	23rd Street and M Street	**F**	**F**	**F**	**F**	**F**	**F**
4	M Street and New Hampshire Avenue	**F**	**F**	**F**	**F**	**F**	**F**
5	21st Street and New Hampshire Avenue	**F**	**F**	**F**	**F**	**F**	**F**
6	21st Street and M Street	**F**	**F**	**F**	**F**	**F**	**F**
7	20th Street and M Street	**F**	**F**	**F**	**F**	**F**	**F**
8	26th Street and L Street	A	A	A	A	A	A
9	25th Street / L Street / Pennsylvania Avenue	**F**	**F**	**F**	**F**	**F**	**F**
10	24th Street and L Street	**F**	**F**	**F**	**F**	**F**	**F**
11	23rd Street and L Street	**F**	**F**	**F**	**F**	**F**	**F**
12	L Street and New Hampshire Avenue	**F**	**F**	E	E	E	E
13	21st Street and L Street	B	B	E	C	B	D
14	20th Street and L Street	B	B	E	B	B	D
15	25th Street and K Street	B	C	D	C	C	C
16	24th Street and Pennsylvania Avenue	**F**	**F**	**F**	**F**	**F**	**F**
17	K Street Service Road and Washington Circle (NW)	C	C	C	C	C	C
18a	24th Street and K Street (N)	B	D	C	C	C	C
18b	24th Street and K Street (S)	C	D	E	D	E	D
19	K Street Service Road and Washington Circle (SW)	A	A	A	A	A	A
20	23rd Street and Washington Circle (N)	D	D	E	E	**F**	E
21	New Hampshire Avenue and Washington Circle (NE)	C	C	D	D	D	E
22	K Street Service Road and Washington Circle (NE)	A	A	A	A	A	A
23a	22nd Street and K Street (N)	B	B	B	C	C	C
23b	22nd Street and K Street (S)	A	A	A	A	A	A
24	21st Street and K Street	C	C	C	C	C	C
25	20th Street and K Street	B	B	D	B	B	D
26	Pennslyvania Avenue and Washington Circle (SE)	B	B	C	C	C	C
27	22nd Street and Pennsylvania Avenue	**F**	**F**	**F**	**F**	**F**	**F**
28	23rd Street and Washington Circle (S)	A	A	A	A	A	A
29	New Hampshire Avenue and Washington Circle (SW)	B	A	A	A	A	A
30	24th Street and New Hampshire Avenue	**F**	B	D	C	**F**	**F**
31	23rd Street and I Street	C	B	A	A	A	A
32	22nd Street and I Street	A	A	B	B	B	B
33	23rd Street and H Street	A	A	**F**	**F**	**F**	**F**

Note: The level of service for some of the intersections deteriorates under the scenario with improvements. This is due to the effect of additional traffic reaching internal intersections as a result of improved capacity at intersections that are currently metering the traffic at entry locations to the study area. While some of the intersections are expected to degrade due to the implementation of the proposed improvements, many intersections are expected to operate at much better LOS than today. Furthermore, the traffic model indicates that the overall delay for the study area network will be lower with the implementation of the proposed improvements during the AM and PM peak hours.